

CLEAN VERSION OF AMENDED SPECIFICATION AND AMENDED CLAIMS

In the Specification:

Please replace the paragraph beginning at page 12, line 3 with the following new paragraph:

Usually, the fiber diameter of either melt-blow non-woven fabrics and glass fiber non-woven fabrics is not constant, but distributed in a certain degree of range, and the filtration accuracy is decided principally by their average fiber diameter and void ratio in the case of those non-woven fabrics. Accordingly, when the fiber diameter of a melt-blow non-woven fabrics or glass fiber non-woven fabrics is described hereinafter, the term "fiber diameter" is intended to mean the average fiber diameter unless otherwise specified. When a melt-blow non-woven fabric is adopted, it is possible to control the average fiber diameter to a value between 0.5 and 40 μ m by the selection of spinning conditions. When a glass fiber non-woven fabric is used, the average fiber diameter can be controlled to a value between 0.1 and 30 μ m. Void ratio of these non-woven fabrics can be adjusted to an appropriate value by compressing these non-woven fabrics by using a calendar roll or the like.

Please replace the paragraph beginning at page 16, line 4, with the following new paragraph:

In order to produce the cylindrical filter shown in Figure 1(b), a method disclosed in Japanese Patent Publication No. Sho 56-49605 can be used. In this case, a non-woven fibrous agglomerate composed of hot-melt adhesive fibers is used as a non-woven fibrous agglomerate for forming pre-filtration layer 4. As an example, a non-woven fibrous agglomerate composed of a high melting point resin and a low melting point resin having a difference in melting point of more than 10 °C can be mentioned. While this non-woven fibrous agglomerate is used as the material for pre-filtration layer 4, it is also used as a material for support layer. First, a non-woven fibrous agglomerate

which forms pre-filtration layer 4 is heated in advance at a temperature higher than the hot-melt adhering temperature of the non-woven fibrous agglomerate, and wound round a suitable winding core to form support layer 2. Thereafter, a non-woven fibrous agglomerate, which has the same width as that of the non-woven fibrous agglomerate of pre-filtration layer 4 and was prepared in advance so as to form precision filtration layer 3 comprising fibers having a diameter smaller than that of the fibers having a smallest diameter in a pre-filtration layer, is wound together with the non-woven fibrous agglomerate for forming the pre-filtration layer so that the number to times of the winding becomes at least 1.5 to form precision filtration layer 3, and then successively winding only the non-woven fibrous agglomerate for forming the pre-filtration layer thereon to form prefiltration layer 4 in which fiber diameter is gradually decreased in the direction of filtration. When the number of winding of the non-woven fibrous agglomerate for forming precision filtration layer 3 is less than 1.5 times, a sufficient filtration accuracy can hardly be attained since the thickness of the precision filtration layer is small. The place at which the non-woven fibrous agglomerate for forming precision filtration layer 3 is wound is the position where the ratio of the thickness of pre-filtration layer 4 to that of support layer (thickness of pre-filtration layer/thickness of support layer) becomes 0.5 to 4 and preferably 0.7 to 4. When the thickness of the pre-filtration layer becomes more than 4 times as large as the thickness of the support layer, the strength of the support layer becomes insufficient. On the other hand, when it becomes smaller than 0.5 times, the accumulation in the pre-filtration layer becomes small and thus it becomes difficult to lengthen the filtration life of filters. Thereafter, they are cooled, a winding core is pulled out, and flat gaskets 6a and 6b are stacked on both ends to complete the production of a filter of the present invention.

Please replace the paragraph beginning at page 18, line 24, with the following new paragraph:

Fig. 3 is diagrammatic representation showing examples of the pattern of change of fiber diameter in the direction of filtration, that is, at the layers between A and B, from the upstream to the downstream in a cross-section of such a filter as shown in Fig. 1 or Figure 2. Whereas when two or more kind of non-woven fibrous agglomerates are piled alternatively, the diameter of the fibers in a precision filtration layer becomes discontinuous, the diameter of the fibers of a non-woven fibrous agglomerate comprised in a precision filtration layer and having a diameter smaller than that of the fibers having a smallest fiber diameter in a pre-filtration layer is indicated herein as representative value.

Please replace the paragraph beginning at page 23, line 3, with the following new paragraph:

Example 3

As the non-woven fibrous agglomerate for forming a pre-filtration layer, the same non-woven fibrous agglomerate as used in Example 1 was used. As the non-woven fibrous agglomerate for forming the polypropylene non-woven fabric used for forming the precision filtration layer in Example 1, a glass fiber non-woven fabric (Trade name: FM-2A, produced by Japan Inorganic Co., Ltd.) having a METSUKU of 150g/m², thickness of 1,000μm, and average fiber diameter of 0.7μm was used. These fabrics were molded by the same manner as in Example 1 into a cylindrical filter having an outside diameter of 70mm, inside diameter of 30mm, and overall length of 250mm, and provided with flat gaskets. The characteristics and performances of the filter thus obtained are shown in Table 1.

Please replace Table 1 beginning at page 28, with the following new Table 1:

Table 1

	Prefiltration Layer						
	Material	Maximum fiber diameter (μm)	Minimum fiber diameter (μm)	Void ratio (%)			
Example 1	PP + propylene copolymer	15	2	89			
Example 2	PP + propylene copolymer	15	2	89			
Example 3	PP + propylene copolymer	15	2	89			
Example 4	PP + propylene copolymer	20	3	89			
Example 5	PP + propylene copolymer	20	3	89			
Example 6	PP	15	2	89			
Example 7	PP + propylene copolymer	15	2	89			
Example 8	PP + propylene copolymer	15	2	89			
Comparative Example 1	PP + propylene copolymer	15	2	89			
Comparative Example 3	PP + propylene copolymer	25	(25)	75			
Comparative Example 4	PP + propylene copolymer	15	2	70			
	Precision Filtration Layer			Filter Performances			
	Material	Fiber diameter (μm)	Void ratio (%)	Filtration Accuracy	Initial pressure loss (kg/cm ²)	Filtration life (min)	Pressure resistant strength (kg/cm ²)
Example 1	PP	1	59	1	1	44	10 <
Example 2	PP	1	95	2	0.3	61	10 <
Example 3	Glass	0.7	93	2	0.3	66	10 <
Example 4	PP	1	95	3	0.1	110	10 <
Example 5	PP	1	95	3	0.1	220	10 <
Example 6	PP	1	59	1	1	59	10 <
Example 7	PP	1	59	1	1	44	10 <
Example 8	PP	1	59	1	1	42	10 <
Example 9	PP	1	59	1	1	46	10 <
Comparative Example 1	Not-used	-	-	4	0.3	66	10 <
Comparative Example 3	PP	1	95	5	0.1	11	10 <
Comparative Example 4	PP	3	59	2	0.5	48	10 <